

CLAIMS

1. Multi-stage transmission in planetary design, particularly an automatic transmission for a motor vehicle, comprising one input shaft (1) and one output shaft (2) located in one housing (G), three single-web planetary gear sets (P1, P2, P3), at least seven rotatable shafts (1, 2, 3, 4, 5, 6, 7), the same as at least six shifting elements (03, 04, 14, 36, 56, 57), including brakes and clutches, the selective engagement of which produces different reduction ratios between the input shaft (1) and the output shaft (2) so that eight forward gears and two reverse gears can be implemented, characterized in that the input results by one shaft (1) permanently connected with one element of the planetary gear set (P1), that the output results via one shaft (2) permanently connected with the ring gear of the second planetary gear set (P2) and the ring gear of the third planetary gear set (P3), that one shaft (3) is permanently connected with one other element of the first planetary gear set (P1), that one shaft (4) is permanently connected with the web of the second planetary gear set (P2) and the web of the third planetary gear set (P3), that one shaft (5) is permanently connected with the ring gear of the first planetary gear set (P1), that one shaft (6) is permanently connected with the sun gear of the second planetary gear set (P2), that one shaft (7) is permanently connected with the sun gear of the third planetary gear set (P3), wherein the shaft (3) is attachable to the housing (G) by one brake (03), the shaft (4) is attachable to the housing (G) by one brake (04), one clutch (14) detachable interconnects the shaft (1) and the shaft (4), one clutch (36) detachably interconnects the shaft (3) and the shaft (6), one clutch (56) detachably interconnects the shaft (5) and the shaft (6) and one clutch (57) detachably interconnects the shaft (5) and the shaft (7).

2. Multi-stage transmission according to claim 1, characterized in that the shaft (1) is permanently connected with the sun gear of the first planetary gear set (P1) and that the shaft (3) is permanently connected with the web of the first planetary gear set (P1).

3. Multi-stage transmission according to claim 1, characterized in that the shaft (1) is permanently connected with the web of the first planetary gear set (P1)

and that the shaft (3) is permanently connected with the sun gear of the first planetary gear set (P1).

4. Multi-stage transmission according to any one of the preceding claims, characterized in that the first planetary gear set (P1) and the third planetary gear set (P3) are designed as plus planetary gear sets and that the second planetary gear set (P2) is designed as minus planetary gear set.

5. Multi-stage transmission according to any one of the preceding claims, characterized in that the second planetary gear set (P2) and the third planetary gear set (P3) are combined as Ravigneaux planetary gear set with one common web and one common ring gear.

6. Multi-stage transmission according to any one of the preceding claims, characterized in that additional free wheels can be used on each adequate place.

7. Multi-stage transmission according to claim 6, characterized in that the free wheels are provided between the shafts (1, 2, 3, 4, 5, 6, 7) and the housing (G).

8. Multi-stage transmission according to any one of the preceding claims, characterized in that input and output are provided on the same side of the housing.

9. Multi-stage transmission according to any one of the preceding claims, characterized in that one axle and/or transfer differential is situated on the input side or on the output side.

10. Multi-stage transmission according to any one of the preceding claims, characterized in that the input shaft (1) can be separated from a prime mover by one clutch element.

11. Multi-stage transmission according to claim 10, characterized in that as clutch element is provided a hydrodynamic converter, a hydraulic clutch, a dry starting clutch, a wet starting clutch, a magnetic powder clutch, or a centrifugal clutch.

12. Multi-stage transmission according to any one of the preceding claims, characterized in that an external starting element, particularly according to

claim 11, can be located in flow direction behind the transmission, the input shaft (1) being fixedly connected with the crankshaft of the engine.

13. Multi-stage transmission according to any one of the preceding claims, characterized in that the starting off results by means of one shifting element of the transmission, the input shaft (1) being permanently connected with the crankshaft of the engine.

14. Multi-stage transmission according to claim 13, characterized in that the brake (04) can be used as shifting element.

15. Multi-stage transmission according to any one of the preceding claims, characterized in that one torsional vibration damper can be situated between engine and transmission.

16. Multi-stage transmission according to any one of the preceding claims, characterized in that one wear-free brake can be situated upon each shaft.

17. Multi-stage transmission according to any one of the preceding claims, characterized in that a power take-off can be situated upon each shaft to drive additional units.

18. Multi-stage transmission according to claim 17, characterized in that the power take-off can be situated upon the input shaft (1) or the output shaft (2).

19. Multi-stage transmission according to any one of the preceding claims, characterized in that the shifting elements are designed as power shiftable clutches or brakes.

20. Multi-stage transmission according to claim 19, characterized in that multi-disc clutches, band brakes and/or tapered clutches can be used.

21. Multi-stage transmission according to any one of claims 1 to 18, characterized in that form-locking brakes and/or clutches are provided as shifting elements.

22. Multi-stage transmission according to any one of the preceding claims, characterized in that an electric machine can be mounted upon each shaft as generator and/or as additional prime mover.